

ORIGINAL



0000064387

BEFORE THE ARIZONA CORPORATION COMMISSION

325

COMMISSIONERS

JEFF HATCH-MILLER, Chairman  
WILLIAM A. MUNDELL  
MIKE GLEASON  
KRISTIN K. MAYES  
BARRY WONG

2006 DEC 11 P 2:35

AZ CORP COMMISSION  
DOCUMENT CONTROL

IN THE MATTER OF THE APPLICATION OF  
ARIZONA PUBLIC SERVICE COMPANY FOR A  
HEARING TO DETERMINE THE FAIR VALUE  
OF THE UTILITY PROPERTY OF THE  
COMPANY FOR RATEMAKING PURPOSES, TO  
FIX A JUST AND REASONABLE RATE OF  
RETURN THEREON, TO APPROVE RATE  
SCHEDULES DESIGNED TO DEVELOP SUCH  
RETURN, AND TO AMEND DECISION NO.  
67744.

DOCKET NO. E-01345A-05-0816

IN THE MATTER OF THE INQUIRY INTO THE  
FREQUENCY OF UNPLANNED OUTAGES  
DURING 2005 AT PALO VERDE NUCLEAR  
GENERATING STATION, THE CAUSES OF THE  
OUTAGES, THE PROCUREMENT OF  
REPLACEMENT POWER AND THE IMPACT OF  
THE OUTAGES ON ARIZONA PUBLIC  
SERVICE COMPANY'S CUSTOMERS.

DOCKET NO. E-01345A-05-0826

IN THE MATTER OF THE AUDIT OF THE FUEL  
AND PURCHASED POWER PRACTICES AND  
COSTS OF THE ARIZONA PUBLIC SERVICE  
COMPANY.

DOCKET NO. E-01345A-05-0827

**STAFF'S NOTICE OF FILING**

Staff of the Arizona Corporation Commission hereby provides notice of filing the Summary  
of the Testimony of William R. Jacobs, Jr., Ph.D, in the above-referenced matter.

RESPECTFULLY SUBMITTED this 11<sup>th</sup> day of December, 2006.

Arizona Corporation Commission

DOCKETED

DEC 11 2006

DOCKETED BY

hr

*Janet Wagner*  
Christopher C. Kempley, Chief Counsel  
Janet Wagner, Senior Staff Counsel  
Charles Hains, Attorney  
Arizona Corporation Commission  
1200 West Washington Street  
Phoenix, Arizona 85007

1 Original and 17 copies of the foregoing filed  
2 this 11<sup>th</sup> day of December, 2006 with:

3 Docket Control  
4 Arizona Corporation Commission  
5 1200 West Washington  
6 Phoenix, AZ 85007

7 Copy of the foregoing mailed this  
8 11<sup>th</sup> day of December, 2006 to:

9 Deborah R. Scott  
10 Kimberly A. Grouse  
11 SNELL & WILMER  
12 One Arizona Center  
13 400 East Van Buren Street  
14 Phoenix, AZ 85004-2202

15 Thomas L. Mumaw  
16 Karilee S. Ramaley  
17 PINNACLE WEST CAPITAL  
18 CORPORATION  
19 Post Office Box 53999, MS 8695  
20 Phoenix, AZ 85072-3999

21 C. Webb Crockett  
22 Patrick J. Black  
23 FENNEMORE CRAIG, P.C.  
24 3003 North Central Avenue, Suite 2600  
25 Phoenix, AZ 85012-2913

26 Michelle Livengood  
27 UniSource Energy Services  
28 One South Church Street, Suite 200  
Tucson, AZ 85702

Donna M. Bronski  
Deputy City Attorney  
City Attorney's Office  
3939 North Drinkwater Boulevard  
Scottsdale, AZ 85251

George Bien-Willner  
3641 North 39<sup>th</sup> Avenue  
Phoenix, AZ 85014

Michael W. Patten  
J. Matthew Derstine  
Laura E. Sixkiller  
ROSHKA DEWULF & PATTEN, PLC  
One Arizona Center  
400 East Van Buren Street, Suite 800  
Phoenix, AZ 85004

Michael L. Kurtz  
BOEHM, KURTZ & LOWRY  
36 East Seventh Street, Suite 1510  
Cincinnati, OH 45202

Scott S. Wakefield  
RUCO  
1110 West Washington Street, Suite 220  
Phoenix, AZ 85007

Lawrence V. Robertson, Jr.  
Post Office Box 1448  
Tubac, AZ 85646

Bill Murphy  
Murphy Consulting  
5401 North 25<sup>th</sup> Street  
Phoenix, AZ 85016

Andrew W. Bettwy  
Karen S. Haller  
Assistants General Counsel  
Legal Affairs Department  
5241 Spring Mountain Road  
Las Vegas, NV 89150

1 Amanda Ormond  
2 The Ormond Group LLC  
3 Southwest Representative  
4 Interwest Energy Alliance  
5 7650 South McClintock, Suite 103-282  
6 Tempe, AZ 85284  
7  
8 Joseph Knauer, President  
9 Jewish Community of Sedona  
10 and the Verde Valley  
11 100 Meadowlark Drive  
12 Post Office Box 10242  
13 Sedona, AZ 86339-8242  
14  
15 David C. Kennedy, Esq.  
16 818 East Osborn Road, Suite 103  
17 Phoenix, AZ 85014  
18  
19 S. David Childers, Esq.  
20 LOW & CHILDERS  
21 2999 North 44<sup>th</sup> Street, Suite 250  
22 Phoenix, AZ 85018  
23  
24 Tracy Spoon  
25 Sun City Taxpayers Association  
26 12630 North 103<sup>rd</sup> Avenue, Suite 144  
27 Sun City, AZ 85351  
28  
29 Tammie Woody  
30 10825 West Laurie Lane  
31 Peoria, AZ 85345  
32  
33 Douglas V. Fant  
34 Law Offices of Douglas V. Fant  
35 3655 West Anthem Drive, Suite A-109  
36 Anthem, AZ 85086  
37  
38 Walter W. Meek, President  
39 Arizona Utility Investors Association  
40 2100 North Central Avenue, Suite 210  
41 Phoenix, AZ 85004  
42  
43 Sein Seitz, President  
44 Arizona Solar Energy Industries Association  
45 3008 North Civic Center Plaza  
46 Scottsdale, AZ 85251

Dan Austin  
Comverge, Inc.  
6509 West Frye Road, Suite 4  
Chandler, AZ 85226  
  
Timothy M. Hogan  
Arizona Center for Law in the Public Interest  
202 East McDowell Road, Suite 153  
Phoenix, AZ 85004  
  
Jay I. Moyes  
Moyes Storey Ltd.  
1850 North Central Avenue, Suite 110  
Phoenix, AZ 85004  
  
Kenneth R. Saline, P.E.  
K.R. Saline & Assoc., PLC  
160 North Pasadena, Suite 101  
Mesa, AZ 85201  
  
Robert W. Geake  
Vice President and General Counsel  
Arizona Water Company  
Post Office Box 29006  
Phoenix, AZ 85038-9006  
  
Lieutenant Colonel Karen S. White  
Chief, Air Force Utility Litigation Team  
AFLSA/JACL-ULT  
139 Barnes Drive  
Tyndall AFB, FL 32403  
  
Greg Patterson  
Arizona Competitive Power Alliance  
916 West Adams Street, Suite 3  
Phoenix, AZ 85007  
  
Jim Nelson  
12621 North 17<sup>th</sup> Place  
Phoenix, AZ 85022  
  
Barbara Klemstine  
Brian Brumfield  
Arizona Public Service  
Post Office Box 53999, MS 9708  
Phoenix, AZ 85072-3999

1 Jon Poston  
2 AARP Electric Rate Project  
3 6733 East Dale Lane  
4 Cave Creek, AZ 85331  
5  
6 Coralette Hannon  
7 AARP Government Relations & Advocacy  
8 6705 Reedy Creek Road  
9 Charlotte, NC 28215  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28

Roseann Osorio

## SUMMARY OF TESTIMONY GIVEN BY

WILLIAM R. JACOBS, JR., Ph.D.

### I. DIRECT

Dr. Jacobs' direct testimony presents the results of GDS' investigation of the performance of Palo Verde Nuclear Generating Station during 2005.

#### Palo Verde Performance

Performance of the Palo Verde Nuclear Generating Station ("Palo Verde" or "Plant") in 2005 was poor by almost any measure. Generation and capacity factors were low and production costs were high compared to historical performance. The NRC ranked Palo Verde in the next to the lowest regulatory category. In addition to two refueling outages, Palo Verde experienced eight unplanned outages and one planned outage in 2005. Because the capital cost of Palo Verde embedded in base rates is high, the Plant must operate well to take advantage of the relatively low fuel and variable costs of the Plant. As a result of this poor performance, the Arizona Corporation Commission ("ACC" or "Commission") Utilities Division Staff ("Staff") retained GDS Associates, Inc. of Marietta, Georgia to investigate the reasons for Palo Verde's poor performance, to make recommendations to improve performance, and to reduce the likelihood of future unplanned outages. GDS conducted this investigation by reviewing documents, such as APS' root cause evaluations and NRC inspection reports. GDS also visited the Palo Verde site, conducted interviews of APS officials at the senior management level, and attended meetings between APS and the NRC.

While the operating and regulatory performance of Palo Verde during 2005 was poor, GDS has not found any evidence or indication that operation of the plant has compromised safety. None of the outages investigated resulted in or from unsafe operations and, in fact, demonstrated that APS was willing to shutdown the plant when any safety concerns were identified. Palo Verde was safely operated throughout 2005.

APS has implemented an aggressive Performance Improvement Plan to return Palo Verde performance to the desired level of excellence. While it is too early to know with certainty if the plan will succeed, the plan is comprehensive and APS has committed substantial management and financial resources to ensure success. Based on our experience with similar plans at other nuclear plants, GDS is optimistic that APS will be successful in achieving improved performance at Palo Verde.

### **Palo Verde Outages**

GDS determined that, of the eleven 2005 outages, four were avoidable and the result of imprudent actions by APS, three were the result of faulty or defective vendor supplied equipment, and one cannot be completely evaluated at this time. GDS did not identify any imprudence related to the remaining three outages. As shown in Table 3 in of the GDS report, APS' estimate of the net replacement power cost is \$16.269 million for the four imprudently incurred outages in 2005 of which \$14.944 million was incurred during the period of April through December when the Power Supply Adjustor ("PSA") was in effect. APS' request for \$44.564 million for recovery of replacement power costs for 2005 Palo Verde forced outages should be reduced by \$14.944 million. Attachment 18 of GDS' report provides Staff's quantification of the total cost impact of these imprudent outages including lost opportunity costs and claimed interest expense. This amount is \$18.996 million for the imprudently incurred outages.

### **Conclusions**

1. Performance of the Palo Verde Plant has declined significantly over the past three years.
2. The number of outages in 2005 was much higher than normal and the capacity factor and generation were lower than should be expected.
3. APS acknowledges the decline in performance and has implemented an aggressive Performance Improvement Plan ("PIP") to return the Plant to its former levels of performance.
4. Four of the 2005 outages were avoidable and the result of imprudence.

5. Some of the unplanned Palo Verde outages were caused by faulty or defective vendor supplied equipment. We have evaluated APS' actions related to these specific outages and have concluded that APS' actions were not imprudent.
6. It is too soon to determine the prudence of the Unit 1 shutdown associated with the shutdown cooling line vibration. This is a unique problem. It appears that APS has made a concentrated effort to resolve the vibration problem, which continued into 2006. Additional investigation will be needed to determine the cause of and responsibility for this outage.
7. Although APS received a yellow finding from NRC in 2004 regarding safety related issues of substantial importance, it is GDS' conclusion that there is no evidence or indication that operation of the plant in 2005 has compromised safety.

#### **Recommendations**

1. The Commission should disallow the additional costs resulting from outages identified as avoidable and imprudent in this report. The resulting disallowance is \$17.373 million (see Table 5). The amount of \$1.623 million incurred before April 1, 2005 should not be eligible for consideration in establishing base fuel costs in the pending rate case.
2. An issue related to the unplanned Palo Verde outages attributable to faulty or defective vendor-supplied equipment is the degree to which APS has sought appropriate legal or other remedies. This report does not address this issue, but instead recommends that the Commission address it in the pending rate case. APS should be given the opportunity to demonstrate the steps that it has taken in this regard, and the Commission should evaluate APS' action.
3. The Commission should establish a Nuclear Performance Standard that would establish minimum acceptable levels of performance for Palo Verde and penalties for periods during which the performance of Palo Verde falls

below the minimum levels. The Nuclear Performance Standard should be considered in APS' pending rate case.

4. The Commission should order APS to submit a semi-annual report to the Commission's Docket Control, describing plant performance, explaining any negative regulatory reports by the NRC or INPO, and providing details of corrective actions taken. APS should submit this report semi-annually until the Commission decides that it is no longer necessary.
5. The Commission should order APS to evaluate its programs to deal with aging equipment at Palo Verde. This evaluation should consider industry experience with aging equipment, programs established at other nuclear plants that have been successful in managing aging equipment issues, and recent experience at Palo Verde. APS should submit a report to the Commission within 120 days of the Commission's order in this matter describing the findings of the evaluation and the actions taken to improve APS' management of aging equipment issues.
6. The Commission should order APS to evaluate its programs for receipt inspection and verification of parts prior to installation. This evaluation should consider industry experience, programs established at other nuclear plants that have been successful in avoiding outages due to installation of incorrect parts, and experience at Palo Verde. APS should submit a report to the Commission within 120 days of the Commission's order in this matter describing the findings of the evaluation and the actions taken to improve receipt inspection and pre-installation verification of parts at Palo Verde.

Dr. Jacobs' testimony also provides additional support for his recommendation of establishing a Nuclear Performance Standard including the rationale and need for and a description of the relevant features to be included.



## **II. SURREBUTTAL**

Dr. Jacobs' Surrebuttal Testimony responds to the rebuttal testimony of APS witnesses Levine, Mattson, Denton, Fitzpatrick, Wheeler and Ewen. The following areas are addressed in Dr. Jacobs' Surrebuttal Testimony:

### **Palo Verde Performance**

Several APS witnesses opined that the performance of Palo Verde should be viewed over a longer time period of up to 10 years. Dr. Jacobs demonstrates that the performance of Palo Verde in 2005 was poor and the prior performance is not relevant in reviewing the performance in 2005. Dr. Jacobs points out that one reason for the decline in performance was that APS management did not identify the decline because of prior good performance. Dr. Jacobs' disputes Dr. Mattson's belief that Palo Verde will be successfully returned to the lowest level of NRC scrutiny given the recent inspection results and pending possibly greater than green finding which may result in Palo Verde being classified in the multiple / repetitive degraded cornerstone category.

### **Use of NRC Reports and Self-Assessments**

Dr. Jacobs rebuts APS' contention that NRC reports and APS self-assessments should not be used in conducting reviews of Palo Verde outages. Dr. Jacobs supports his position that these are the best types of documents from which to gather the facts about a nuclear plant outage. While any outage review must be retrospective, these documents provide an excellent summary of the facts and are not based entirely on hindsight.

### **Palo Verde Outages**

Dr. Jacobs addresses APS' responses to the outages that Dr. Jacobs identified as caused by imprudence. He responds to APS' comments, reviews the causes and facts of the outages and provides additional support for his conclusions that the outages were the result of imprudence.

### **Nuclear Performance Standard**

Dr. Jacobs addresses several concerns with the proposed Nuclear Performance Standard identified by APS witnesses. Dr. Jacobs explains why the NPS need not be symmetrical to provide a reward for good performance as well as a penalty for poor performance. Dr. Jacobs' reviews APS' criticism of his choice of comparison group and demonstrates that his comparison group is very similar to the group recommended by the APS witness.

### **Response to APS Witness Ewen**

Dr. Jacobs responds to Mr. Ewen's criticism of the quantification of outage cost impacts. These responses address Mr. Ewen's concerns with:

- The Unit 2 refueling water tank outage replacement power costs quantification;
- Quantification of lower margins due to lost off-system opportunity sales;
- The Unit 3 refueling water tank outage replacement power cost quantification;
- Replacement power costs for the Unit 1 reactor trip;
- Claim that some of the recommended disallowance has already been included in base rates;
- The proposed offset to imprudent Palo Verde outage disallowance for APS coal plant performance.

Mr. Ewen's concerns in each of these areas are addressed and rebutted.